

## SOME NOCTUID MOTHS OF EASTER ISLAND, WITH AN ADDITIONAL RECORD (LEPIDOPTERA: NOCTUIDAE)

### ALGUNAS POLILLAS NOCTUIDAS DE ISLA DE PASCUA, CON UN REGISTRO ADICIONAL (LEPIDOPTERA: NOCTUIDAE)

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#### ABSTRACT

The study of six noctuid moths from Easter Island: *Achaea janata* (Linnaeus), *Agrotis ipsilon* (Hufnagel), *Ctenoplusia albostrigata* (Bremer and Grey), *Chrysodeixis chalcites* (Esper), *Mythimna loreyi* (Duponchel) and *Spodoptera mauritia* (Boisduval) (New Record) is made. Geographical distribution, host plants, morphological and chromatic variations mainly in cosmopolitan species are given. Redescriptions and morphological details of the genitalia are given.

KEYWORDS: Lepidoptera, Noctuidae, Easter Island, Systematics.

#### RESUMEN

Se hace el estudio de seis polillas noctuidas de la Isla de Pascua: *Achaea janata* (Linnaeus), *Agrotis ipsilon* (Hufnagel), *Ctenoplusia albostrigata* (Bremer & Grey), *Chrysodeixis chalcites* (Esper), *Mythimna loreyi* (Duponchel) and *Spodoptera mauritia* (Boisduval) (Nuevo Registro). Se entregan la distribución geográfica, plantas hospedadoras, variaciones morfológicas y cromáticas, especialmente en especies cosmopolitas. Se entregan redescpciones en los casos que no existe una buena descripción formal y detalles morfológicos de la genitalia.

PALABRAS CLAVES: Lepidoptera, Noctuidae, Isla de Pascua, Sistemática.

#### INTRODUCTION

Easter Island belongs to the Chilean territory and it is known by its ancient culture vestiges. It is located 3,700 km. far from the South American continent at 27° 10' S 109° 23' W, with an area of 118 km<sup>2</sup>.

Information about this island's lepidoptero-fauna is restricted to few lists, some figures of adults and their genitalia used for the identification of some species (Fuentes, 1914; Olalquiaga, 1946; Aurivillius, 1922; Viette, 1950; Campos & Peña, 1973; Peña, 1987; lately Holloway, 1990).

The present work identifies six species of noctuid moths from Easter Island found among the material deposited at the Museo de Zoología, Universidad de Concepción (MZUC), Chile. Redescriptions and biological data are included.

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MATERIAL AND METHODS

Fourty-two specimens (21 males and 21 females) from the Zoological Museum of the University of Concepcion, Chile (MZUC) were studied.

Systematics features based on wing maculation, male and female genitalia, using conventional methods of genitalia extraction (Angulo & Weigert, 1977) were done.

ABBREVIATIONS:

- a.a : anterior apophysis
- amp : ampulla
- a.p : posterior apophysis
- ce. bu : cervix bursae
- cl : clasper
- clv : clavus
- co : cornuti
- co.bu : corpus bursae
- cu : cucullus
- c.v : valve costule
- di : digitus
- du.bu : ductus bursae
- dus : ductus seminalis
- es : spines
- lovp : lobe of the ovipositor
- osbu : ostium bursae
- pu : pseudouncus
- sac : saccus
- sacl : sacculus
- sutl : surstylus
- str : sterigma
- un : uncus
- yu : yuxta

RESULTS

The following six species were recognized among the studied material:

*Achaea janata* (Linnaeus).  
(Figs. 1, 8, 9 and 12)

*Geometra janata* Linnaeus, 1758, p. 527.

*Achaea janata* (L.). Hampson, 1913, p. 536; Edwards, 1978, p. 332.

MALE GENITALIA ( FIGS.8 AND 9):

Valves slightly squared and rounded in shape. Clasper complex located at dorsal margin of the valve, each component equal in length, originated at the same place. Uncus base wide and bifid apically. Pseudouncus thick with long hair. Anterior part of the aedeagus with microspines, with two spines located at half of its length present, posterior end with a projection and a thick spine at the tip. Clavus developed, thin and elongated.

FEMALE GENITALIA (FIG. 12): Sterigma ventrally strong. Ductus bursae wide and thick, where it joints bursa, has microspines (it is the signum). Bursa copulatrix subspherical, without arms, with only few longitudinal folds. Posterior apophysis twice as long as the anterior ones.

Wing expansion: 55-60 mm

HOST PLANT

*Ricinus communis* (Aurivillius in Skottsberg, 1924); *Araucaria cunninghamii* Ait.; *Bauhinia* sp.; *Acalypha hispida* Birm. f. *A. wilkesiana* Muell-Arg.; *Andrachne decaisnei* Benth.; *Codiaeum variegatum* (L.); *Crotom* sp.; *E. atoto* Forst.; *E. drummondii* Boiss.; *E. hirta* L. mangroves (probably *Excoecaria agallocha* L.); *Excoecaria parvifolia* J. Muell.; *Phyllanthus brisbanicus* F.M. Bail.; *Abutilon* sp.; *Gossypium* sp.; *Acacia bidwillii* Benth.; *Acacia cunninghamii* Hook.; *Mimosa* sp.; *Eucalyptus* sp.; *Glycine max* (L); *Emex australis* Steinh.; *Macadamia integrifolia* Maid and Betche.; *M. tetraphylla* L.; *Rosa* sp.; *Litchi chinensis* Sonner.; *Tribulus terrestris* L. (Edwards, 1978).

GEOGRAPHICAL DISTRIBUTION:

Persic Gulf, Punjab, Philippines, Java, Australia, New Zeland, Tahiti, Malaysia, Easter Island (Chile) (Hampson, 1913).

MATERIAL EXAMINED:

5 males, 2 females: 2 males, Isla Pascua, Mataveri, 8-agosto 1972, Cekalovic Coll.; 1 male, I. Pascua, Mataveri, 22-agosto 1972, H. Toro Coll.; 2 male, I. Pascua, Mataveri, 8-agosto 1972, Cekalovic Coll.; 2 females, Isla Pascua, Mataveri, 8-agosto 1972, Cekalovic Coll.

*Agrotis ipsilon* (Hufnagel)

(Figs. 3, 4, 10 and 11)

*Phalena ipsilon* Hufnagel, 1766, p. 416.

*Noctua ypsilon* Rottemburg, 1776, p. 141.

*Agrotis ypsilon* (Rottemburg). Hampson, 1903, p. 368; Draudt in Seiz, 1924, p. 56; Köhler, 1945, p. 101; Forbes, 1954, p. 24.

*Agrotis ipsilon* (Hufnagel). Köhler, 1967, p. 308.

MALE GENITALIA (FIG 10):

Valves elongated, corona present. Clasper half in extension of the valve. Yuxta subquadrangular. Uncus elongated and curved, thick spine-like process at the tip. Saccus subrectangular, with a medial projection to the apical border. Aedeagus elongated. Vesica four times longer than the sheath, with some small spines, and a scobinate plate between the sheath and the base of vesica.

FEMALE GENITALIA (FIG. 11):

Dorsal tip of bursa copulatrix rounded. Signum with two slits (with some inner short spines) ventrad to the apex of bursa. Posterior apophysis 2.6 times longer than anterior apophysis. Cervix bursae thin, rolled over itself, 3 times longer than corpus bursae.

Wing expansion: 30-40 mm.

HOST PLANTS.

*Lycopersicon esculentum* Mill.; *Solanum tuberosum* L.; *Zea mays* L.; *Nicotiana tabacum*;

*Malus sylvestris* Mill.; *Prunus persica* L.; *Asparagus officinalis* L.; *Phaseolus lunatus* L.; *Curcubita maxima* L.; *Lactuca sativa* L.; *Allium cepa*; *Beta rapacea* Kock. (Angulo, 1975).

GEOGRAPHICAL DISTRIBUTION

Canada, U.S.A., Mexico, Guatemala, Costa Rica, Venezuela, Peru Argentina, Himalayas, Ceylan, Java, New Zeland, Hawaii, Brazil, Japan, China, Easter Island (Chile). (Hampson, 1913).

MATERIAL EXAMINED

7 males, 3 females: 4 males, I. Pascua, Mataveri, 22-agosto 1972, H. Toro Coll.; 1 male, Isla Pascua, Mataveri, 8-agosto 1972, Cekalovic Coll.; 1 male, Isla Pascua, Mataveri, Agosto-7 1972, Exp. I. Pascua; 1 male, Isla Pascua, Mataveri, 22-agosto 1972, H. Toro Coll.; 1 female, Isla Pascua, Moe-Roa, 4-agosto 1972, Cekalovic Coll.; 2 females, I. Pascua, Mataveri, 22-agosto 1972, H. Toro Coll.

*Ctenoplusia albostriata* (Bremer and Grey).

(Figs. 6 and 17)

*Plusia albostriata* Bremer and Grey, 1853, p. 18.

*Plusia oxygramma* Hampson, 1894, p. 545, (nec Geyer, 1832)

*Phytometra albostriata* (Bremer and Grey). Hampson, 1913, p. 496.

*Chrysodeixis albostriata* (Bremer and Grey). Clarke, 1971, p. 41.

*Ctenoplusia albostriata* (Bremer and Grey). Holloway, 1990.

MALE GENITALIA (FIG. 17):

Uncus elongated and curved from its basal third; base equally thick to the apex, one unciform spine present at the tip. Tegumentum wide, with sub-ovalated and elongated arms. Valves elongated, medial width 1/10 valve length. Apex of cucullus with genital combs formed by setal like-hairs.

Clasper elongated reaching to the basal third of the valve, apex thicker and claviform. Ampulla of the complex clasper's short 1/2 times clasper's length, with a pointed and setosous apex. Short digitus and rounded apex. Saccus elongated, 1/2 times the valve length. Yuxta suboval, lower border almost triangular in shape. Aedeagus elongated. Vesica elongated, base with sclerotized microspines and apical third with one spine.

Wing expansion: 15 mm.

#### HOST PLANTS

Compositae, boraginaceae, convolvulaceae. (Holloway, 1990).

#### GEOGRAPHICAL DISTRIBUTION

Australia, Corea, Rapa, Fiji, Queensland, India, Java, Siberia, Easter Island (Chile). (Angulo, 1978).

#### MATERIAL EXAMINED

2 males: 1 male, Isla Pascua, Mataverí, 8-agosto 1972, Cekalovic Coll.; 1 male, Isla Pascua, Mataverí, agosto-1972, Exp. I. Pascua.

### *Chrysodeixis chalcites* (Esper) (Figs. 7, 13 - 16)

*Phalaena chalcites* Esper, 1789, p. 447.

*Phytometra chalcites* (Esper). Hampson, 1913, p. 484.

*Chrysodeixis chalcites* (Esper). Clarke, 1971, p. 41.

#### MALE GENITALIA (FIGS 13 - 15):

Uncus elongated, basal third curved, apex straight with a curved and dark spine. Tegmentum oval with lateral arms triangle-like in shape. Valves elongated, wider in its basal third, apex rounded, its length six times longer than the maximum width (and eight times longer than medial width),

apex with setae and setae like-hair. Clasper elongated, wider at the apex and finishing in a rounded club-like with setal hairs. Saccus elongated subequal in length to the valve, apex more acute. Yuxta subquadrangular. Aedeagus elongated and its posterior apex globose, three times more longest than the rest. Vesica elongated with thirteen long spines along this length at its base another thirteen short spines.

#### FEMALE GENITALIA (FIG. 16):

Ostium bursae conspicuous. Ductus bursae big, straight and membranous, weakly sclerotized, with a ring near the ostium and the opening of the bursa. Bursa ovoid, weakly sclerotized near its opening, at the ductus bursae and at the lateral half of its right wall; anterior part with small appendix cone-like. Ductus seminalis beyond to the appendix.

Wing expansion: 15 mm.

#### HOST PLANTS

*Urticaria* sp., *Salvia* sp., *Echium* sp., *Marrubium* sp., *Ficus* sp. (Hampson, 1913).

#### GEOGRAPHICAL DISTRIBUTION

Africa (Madagascar), Germany, Asia Minor, Australia, China, Korea, Spain, Greece, Hungary, Rapa, Fiji, Tahiti, Hawaii, Easter Island (Chile). (Angulo, 1978).

#### MATERIAL EXAMINED

1 male: 1 male, I. Pascua, Mataverí, 22-agosto 1972, H. Toro Coll.

### *Mythinna loreyi* (Duponchel) (Figs. 2, 18 - 20)

*Noctua loreyi* Duponchel, 1827, p. 81.

*Noctua caricis* Treitske, 1835, p. 91.

*Leucania curvula* Walker, 1856, p. 102.

*Leucania collecta* Walker, 1856, p. 105

*Leucania exterior* Walker, 1856, p. 106.

*Leucania thoracica* Walker, 1856, p. 107.

*Leucania denotata* Walker, 1856, p. 107.

*Cirphis loreyi* (Duponchel). Hampson, 1905, p. 492.

*Mythinna loreyi* (Duponchel). Viette, 1950. Holloway, 1990, p. 721.

MALE GENITALIA (FIGS 19 and 20):

Uncus elongated with a spine-like end, base wider than apex. Valves subsquares, rounded at the tip, without corona, of the valve distal third ventral edge with a pronounced low cut. Saccus rounded basally. Sacculus with a polygonal process (subcircle) with a wide dorsal low cut. Ampulla spatulate at the tip. Digitus with small seta near the half length of the ampulla. Normal aedeagus. Vesica bifurcated, both arms equal in length, ventral arm corrugated with an unciform spine at the tip, dorsal arm smooth with a big grooved spur. Clasper half is orientated to the tip of the valve (cucullus), distad half directed to the ventrad finishing in a point; both arms form an obtuse angle.

FEMALE GENITALIA (FIG. 18) :

Ostium bursae developed. Ductus bursae slightly inward dorsally and with grooves. Cervix bursae small, situated laterally to the ductus bursae. Corpus bursae bulky. Signum obsolete; posterior and anterior apophysis equal in length.

Wing expansion: 35-40 mm.

GEOGRAPHICAL DISTRIBUTION

France, Australia, Japan, Philippines, Fiji, Easter Island (Chile). (Hampson, 1905).

MATERIAL EXAMINED:

3 males, 4 females: 2 males, I. Pascua, Mataverí, 22-agosto 1972, H. Toro Coll.; 1 male, Isla Pascua, Mataverí, 22-agosto 1972, H. Toro Coll.; 2 females, I. Pascua, Mataverí, 22-agosto 1972, H. Toro

Coll.; 2 females, Isla Pascua, Mataverí, 8-agosto 1972, Cekalovic Coll.

*Spodoptera mauritia* (Boisduval)

(Figs. 5, 21 - 23)

*Hadena mauritia* Boisduval, 1833, pl. 13 f. 9.

*Spodoptera acronyctoides* Gueneé, 1852, p. 154.

*Spodoptera nubes* Gueneé, 1852, p. 155.

*Prodenia infecta* Walker, 1856, p. 196.

*Prodenia insignata* Walker, 1856, p. 197.

*Agrotis transducta* Walker, 1856, p. 344.

*Prodenia permunda* Walker, 1857, p. 723.

*Laphygma gratiosa* Walker, 1865, p. 651.

*Laphygma squalida* Walker, 1865, p. 652.

*Prodenia venustula* Walker, 1865, p. 654.

*Celoena bisignata* Walker, 1865, p. 679.

*Agrotis aliena* Walker, 1865, p. 694.

*Agrotis submarginalis* Walker, 1865, p. 699.

*Agrotis bisignata* Walker, 1865, p. 702.

*Hadena obliqua* Walker, 1865, p. 736.

*Spodoptera mauritia* (Boisduval), Hampson, 1909, p. 236.

MALE (FIG. 5):

Labial palpus elongated, longer more than the antenal basis; second and third segments equal in length to the ocular diameter, dressed with brown and whitish scales; frons with whitish and some dark-brown scales. Antennae ciliated. Cilia shorter than the width of the respective segment. Patagia and tegula with grey and white scales; lateral and ventral sides with whitish to stramineous hairs. Fore wing 1.3 times longer than its maximum width; bottom part with dark brown scales, and some whitish scales in the spots and lines; basal and anterior transverse lines weak; orbicular spot suboval with yellow brownish scales, outlined by whitish scales, with an oblique wide band extended from the costal border through the orbicular spot and finishing at the base of  $M_1$ ,  $Cu_1$  and  $Cu_2$  veins; reniform spot suboval, with dark brown scales; transversal posterior line weakly represented, posterior third with whitish scales; apical spot with whitish scales at the level of  $M_1$ , at this point originates the subterminal line with

whitish scales and two or three denticles; subterminal line represented by eight dark brown and equidistant points. Hing wing 1.2 times longer than its maximum width, bottom part with hyaline scales and white hairs, external wing edge dark brown scales, level of R and M<sub>1</sub> with white scales; underside of the wing with scales similar to the ones at the upperside, except by some whitish scales and some dark-brown scales mixed at the costal line. Abdomen with stramineous and dark-brown scales and some intermingled.

MALE GENITALIA (FIGS 21 AND 22) :

Valves rounded, apical third ventral groove V-shaped. Corona with fine hairs at the apical fourth of the valve. Clasper wide finishing in a ventral, sclerotized and curved point. Subpolygonal yuxta longer than its width; tegumen wide, with a groove at the tip (near the uncus base), subrectangular in shape. Vesica bulky, straight at its apical third where it forms a thin, and elongate chitinized structure which presents some small spines.

FEMALE:

Similar to the male.

FEMALE GENITALIA (FIG 23):

Sterigma inconspicuous and weakly chitinized. First part of the ductus bursae inward rolled and finally straight. Bursa copulatrix unisacular, bulky and with dorsal grooves. Anterior apophysis shorts and thick, posterior apophysis three times longer than the anterior apophysis base wide and elongate and thin end.

Wing expansion: 16 mm.

GEOGRAPHICAL DISTRIBUTION

Madagascar, China, Punjab, India, Australia, Philippines, Tahiti, Islas Marquesas, (Hampson, 1909). Easter Island (Chile).

MATERIAL EXAMINED

2 males, 7 females: 1 male, I. Pascua, Mataveri, 22-agosto 1972, H. Toro Coll; 1 male, Isla Pascua, Mataveri, 22-agosto 1972, H. Toro Coll; 2 hembras, Isla Pascua, Mataveri, 22-agosto 1972, H. Toro Coll.

KEY TO THE NOCTUIDAE FROM EASTER ISLAND

- 1. Hind wings dark-brown to blackish, with three white spots at the termen, and a white medial line; wing expansion 60 mm ..... *Achaea janata* (L.)
- 1'. Hind wings not as above; wing expansion no more than 40 mm ..... 2
- 2(1'). Hairy eyes. Fore wing without lines except the terminal line represented by dark points..... *Mythimna loreyi* (Duponchel).
- 2' Eyes without hairs ..... 3
- 3(2'). Fore wings with silvery or yellowish maculae ..... 4
- 3'. Fore wings not as above ..... 5
- 4(3). Fore wings with orbicular and reniform spots suboval in shape and proximal..... *Chrysodeixis chalcites* (Esper).
- 4'. Fore wings with an acute diagonal spot at the tip, finishing before the posterior border..... *Ctenophusia albostrigata* (Bremer and Gray).
- 5(3'). Hind wings whitish and iridescence; fore wings with obsolescent lines..... *Spodoptera mauritia* (Boisduval).
- 5'. Hind wings whitish and over the veins there are dark scales; fore wings with strong dark lines against with the background colour ..... *Agrotis ipsilon* (Hufnagel).

## DISCUSSION

The cosmopolitan species *A. ipsilon* (Hufnagel) found in Easter Island presents a distinctive sexual heterochromism: the males have fore wings unifornes in colour and, without the strong division at the postmedial line or with the strong color variation as in the continental specimens.

*Peridroma saucia* (Hübner), a cosmopolitan species mentioned for Easter Island by Angulo and Weigert (1975), was not found among the examined material. However, this species could probably be at this island.

The species *S. mauritia* (new record), *M. loreyi*, *Ch. chalcites*, *C. albostrata* and *A. janata* belong to the "australian" faune (i.e. Australia, New Guinea, Tasmania and Pacific Islands). They are also present in Hawaii, Fiji, Tuamotu, Rapa and Marquesas.

*C. albostrata* (Bremer and Grey) has a chromatic form with an oblique spot distinctively remarkable in the fore wing. Clarke (1971) reports many chromatic morphs at Rapa Island where the males present a morph which has the oblique line remarkless against the black background colour. The female has two chromatic morphs, one of them is similar to the male found at Easter Island and the other with a whitish and slight spot. This means that these two chromatic morphs could be found at Easter Island.

It is possible to find three components for the lepidopterofauna of Easter Island. These are: a) Polynesian, b) Chilean continental, and c) Cosmopolitan.

Finally, it is likely to find other species of noctuid moths in Easter Island, such as: *Spodoptera litura* (Fabricius), *Chasmodon tibialis* (Fabricius), *Mocis frugalis* (Fabricius) and *Anomis flava* (Fabricius). All of them belong to the australian faune.

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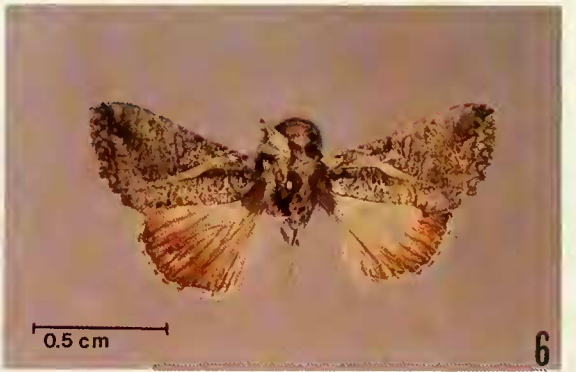
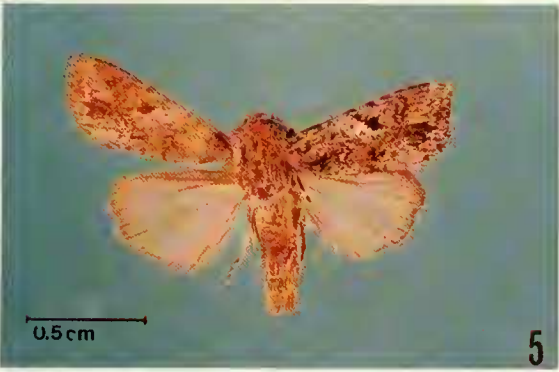
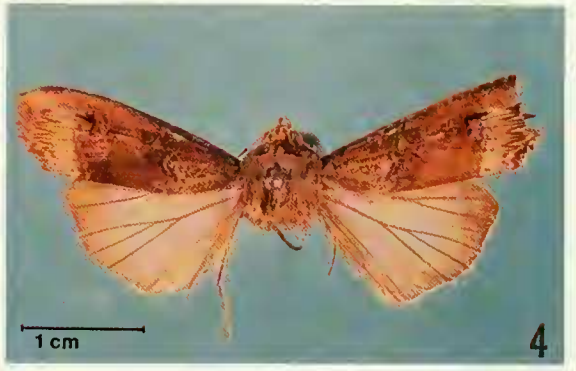
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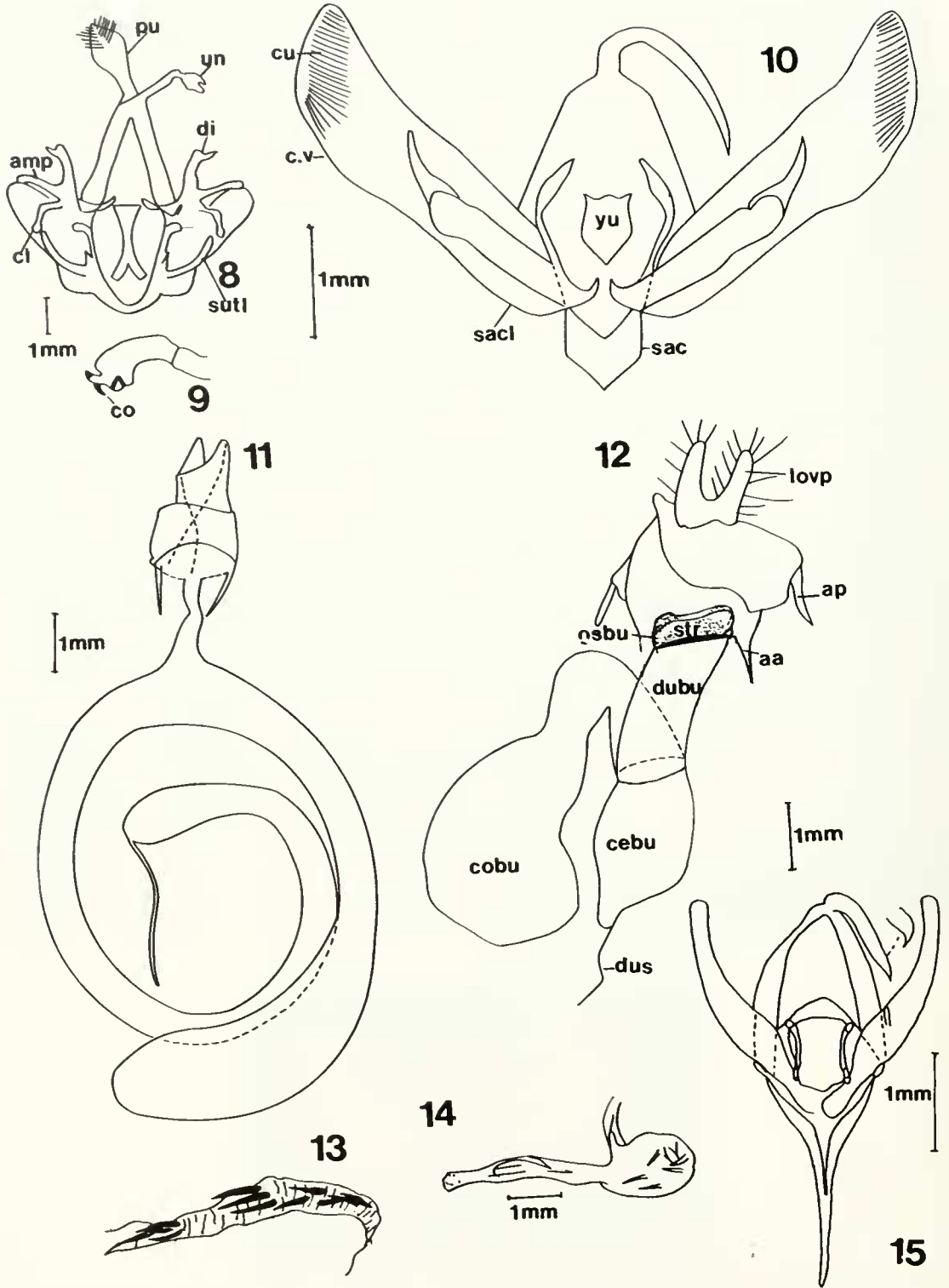
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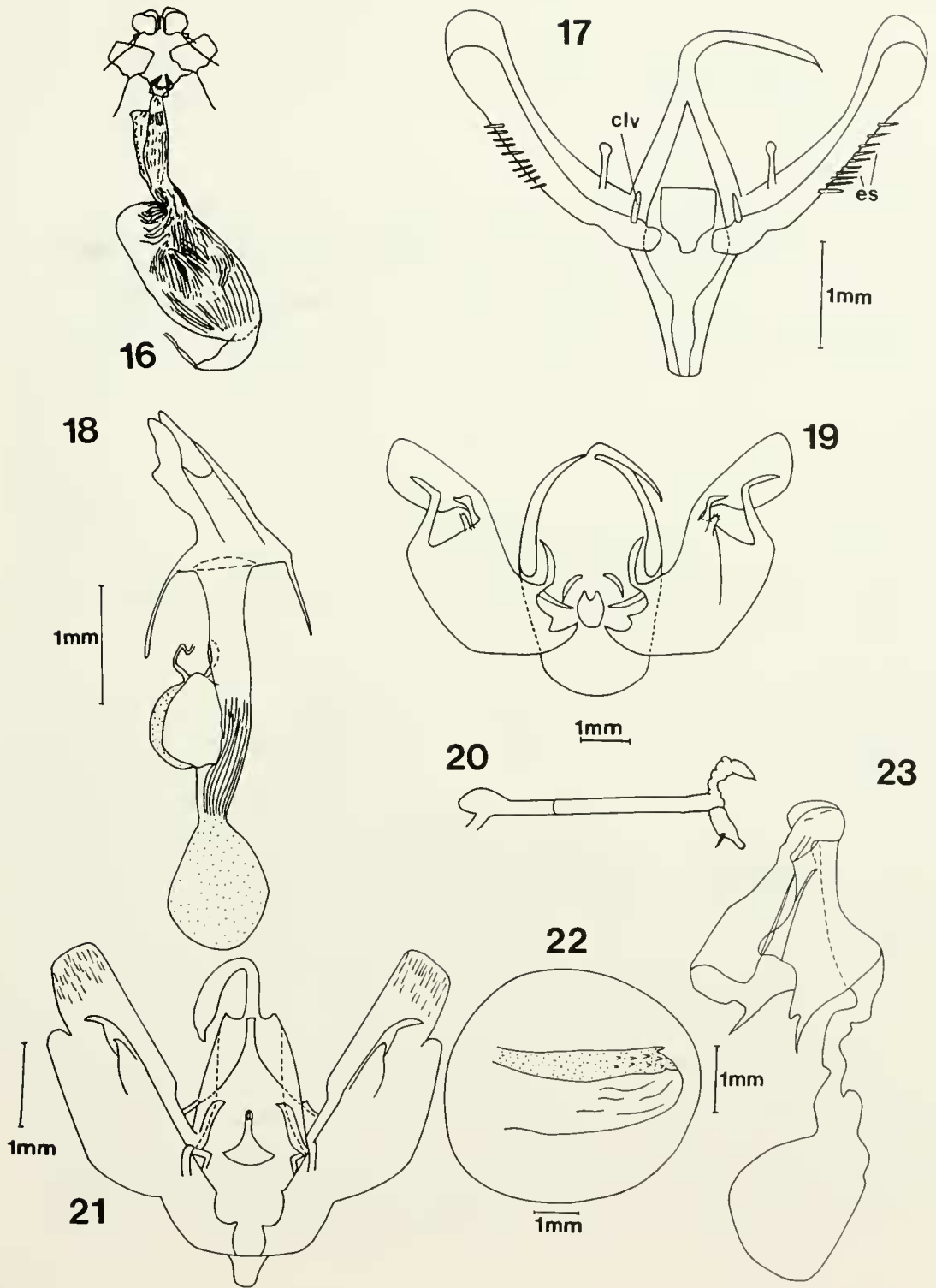




FIGS. 1-7: Fig.1. *Achaea janata* (L.). Female; Fig.2. *Mithymna loreyi* (Duponchel), Male; Fig. 3. *Agrotis ipsilon* (Hufnagel). Male; Fig. 4. *Agrotis ipsilon* (Hufnagel), Female; Fig. 5. *Spodoptera mauritia* (Boisduval), Male; Fig. 6. *Ctenoplusia albostrigata* (Bremer & Grey), Male; Fig. 7. *Chrysodeixis chalcites* (Esper), Male.



FIGS. 8-15: *Achaea janata* (L.): Fig. 8-9. Male genitalia; Fig. 12. Female genitalia; *Agrotis ipsilon* (Hufnagel); Fig. 10. Male genitalia; Fig. 11. Female genitalia; *Chrysoideixis chalcites* (Esper); Fig. 13-15. Male genitalia.



FIGS. 16-23; *Chrysodeixis chalcites* (Esper): Fig. 16. Female genitalia; *Ctenoplusia albostrata* (Bremer & Grey): Fig. 17. Male genitalia; *Mithymna loreyi* (Duponchel): Fig. 18. Female genitalia; Fig. 19-20. Male genitalia; *Spodoptera mauritia* (Boisduval): Fig. 21-22. Male genitalia; Fig. 23. Female genitalia.